Project

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

April 4, 2000

Reply To
Attn Of: OW-131

Jeanne Hanson
U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Marine Fisheries Services
222 W Seventh Avenue, #43
Anchorage, Alaska 99513-7577

RE: John M. Asplund Water Pollution Control Facility
Municipality of Anchorage

Dear Ms. Hanson:

The Environmental Protection Agency (EPA) is in the process of reissuing a National Pollutant Discharge Elimination System (NPDES) permit for the above referenced facility. In association with the NPDES permit, the Alaska Department of Environmental Conservation (DEC) has submitted to EPA, State adopted site-specific criteria (SSC) for metals and turbidity for the upper Cook Inlet - Point Woronzoff area. EPA has the responsibility to review and approve or disapprove any water quality standards revisions including SSC developed and adopted by Alaska.

EPA reissuance of the NPDES permit and EPA approval of SSC are considered federal actions which are subject to the consultation requirements of Section 7 of the Endangered Species Act. Pursuant to the Section 7 consultation requirements, EPA has prepared a biological evaluation (BE) to identify any potential effects on endangered or threatened species in the project area, resulting from the NPDES permit reissuance or EPA approval of the SSC for metals and turbidity.

EPA has determined that reissuance of the NPDES permit for the water pollution control facility and the approval of site-specific numeric criteria for metals and a narrative criterion for turbidity are not likely to adversely affect the endangered and threatened species identified by your agency on February 7, 2000. The purpose of this letter is to request your concurrence or non-concurrence with this determination. In order to accommodate our schedule for reissuing the final permit and completing our approval of the SSC , we would appreciate your response by April 28, 2000, if possible.

If you have any questions or comments regarding this letter or the enclosed BE, feel free to contact me by telephone at (206) 553-1295 or email at brough.sally@epamail.epa.gov.

Sincerely,

Sally Brough

Sally Brough
Water Quality Standards Coordinator

April 4, 2000

Biological Evaluation of Site-Specific Water Quality Criteria for the Point Woronzof Area of Cook Inlet and Reissuance of the Asplund Water Pollution Control Facility NPDES Permit

for the
National Marine Fisheries Service

Prepared by:

U. S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

I. Project Description

U.S. EPA, Region 10, proposes to undertake two federal actions contemplated for the Point Woronzof area of Upper Cook Inlet. The actions are: 1) EPA reissuance of a National Pollutant Discharge Elimination System (NPDES) permit for the Municipality of Anchorage's John M. Asplund Water Pollution Control Facility and 2) EPA approval of State of Alaska site-specific water quality criteria revisions for the Point Woronzof area.

A. NPDES permit reissuance

The first action involves EPA issuance of a permit to regulate a point source discharge. The Clean Water Act (CWA) authorizes EPA to administer the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES program regulates discharges from point sources to waters of the United States. While the majority of states are authorized to administer the NPDES program, the State of Alaska is not among them. Thus, EPA, Region 10, regulates the point source discharges in the state by issuing NPDES permits.

Discharge Location.

The outfall discharges to the saline estuarine waters of Knik Arm in Cook Inlet, 804 ft from shore off Point Woronzof (Figure 1). The discharge depth of the diffuser during the typical 24-hour tidal cycle range from 11.5 feet to 40.5 feet. The outfall location is 61° 12' 22.5" N, 150° 01' 8.7" W. The semidiurnal mixed tides in Knik Arm have a diurnal range of 30 ft and an extreme range of 39 ft. The tides produce swift currents and vigorous mixing off of Point Woronzof. Knik Arm exhibits high tidal velocities (up to approximately 8.2 ft/sec), extensive intertidal mudflats (60 percent of Knik Arm), a brackish salinity range (from 4 parts per thousand (ppt) in summer to 21 ppt in winter), and ice flows from November through April. Currents are influenced primarily by the tides and secondarily by freshwater inflow.

The major rivers and streams contributing fresh water to Knik Arm include the Matanuska River, Knik River, Eagle River, Ship Creek, and Chester Creek. These sources of fresh water, combined with other rivers flowing into Cook Inlet, keep the salinity of Knik Arm generally below 20 ppt. The strong tidal mixing results in weak vertical density gradients throughout the year.

Knik Arm in the vicinity of the Anchorage outfall is classified by the State of Alaska as marine water subject to water quality criteria established for water use classes 2 (A-D) (18 AAC 70.020): aquaculture, seafood processing and industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, other aquatic life and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life. Further description of the waters in the action area including circulation, currents, flushing, and stratification can be found in the Fact Sheet accompanying the draft permit, issued November 8, 1999.

Facility Description.

The Municipality of Anchorage treatment plant serves the entire Anchorage area. Plant influent is primarily of domestic origin, although an industrial component is included. There are no combined sewers in the Anchorage sewer system. The existing facility provides primary

treatment for a design average flow of 58 million gallons per day (mgd) and a maximum hourly flow of 154 mgd. The actual average daily discharge is approximately 33 mgd. The applicant projects an average daily discharge of 36 mgd for the year 2005 when EPA will next review the permit.

Existing treatment units provide screening, grit removal, sedimentation, skimming, and chlorination. Sludge from the primary clarifiers is thickened and dewatered. The dewatered sludge and skimmings are incinerated and the ash disposed of in a sanitary landfill. Within the permit period, the sludge volume is expected to increase above the incinerator capacity. The excess sludge will be dewatered and disposed at the city's landfill.

Chlorinated primary effluent is discharged through a 120 inch diameter chlorine contact tunnel and then through an 84 inch diameter outfall to Cook Inlet. Technology based limits for this discharge include biological oxygen demand and total suspended solids. Water quality based limits for this discharge include pH, chlorine, and fecal coliform bacteria. Additional description of the facility including activities and physical characteristics of the discharge can be found in the EPA Fact Sheet for the EPA proposed reissuance of the permit which was made available for public review on November 8, 1999.

B. Site-Specific water quality criteria revisions

Alaska has adopted revisions to its water quality standards regulations to establish numeric site-specific criteria for a defined portion of upper Cook Inlet near Point Woronzof. The numeric site-specific criteria are acute and chronic aquatic life criteria for arsenic, cadmium, chromium VI, copper, lead, mercury, nickel, selenium, silver, and zinc (all measured using the dissolved method) and turbidity.

Site-Specific Area

The area for which the State of Alaska has adopted site-specific criteria is shown in Figure 2. The site-specific area is defined by natural physical features, boundaries and local bathymetry, as well as consideration of the physical oceanographic processes in the area. The area extends from the constriction of Knik Arm at Point Cairn to the northwest, is bounded by the shoreline to the mudflats at the entrance to Turnagain Arm and Fire Island on the southwest and west respectively.

The size of the site-specific area was determined based on two factors: the distance of a tidal excursion of a water parcel and the farfield dilution predictions of hydrodynamic and water quality models of Cook Inlet. The site-specific area is less than 1/3 of a tidal excursion and is contained within the immediate tidal influence occurring in the vicinity of Pt. Woronzof.

Numeric Site-Specific Criteria

The numeric site-specific criteria adopted by Alaska are consistent with EPA's most recent national criteria guidance for metals. EPA's criteria guidance is developed under Section 304(a) of the CWA and is based solely on data and scientific judgements on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a)

criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. The State's numeric site-specific criteria are shown in the following table. Please note that metals criteria for marine waters do not vary with water hardness.

Site-Specific Criteria for Upper Cook Inlet

POLLUTANT	**ACUTE** (ug/l)	**CHRONIC** (ug/l)
Arsenic	69	36
Cadmium	42	9.3
Chromium VI	1100	50
Copper	4.8	3.1
Lead	210	8.1
Mercury	1.8	0.025
Nickel	74	8.2
Selenium	290	71
Silver	1.9	--
Zinc	90	81
Turbidity	not to exceed the natural condition	not to exceed the natural condition

Alaska has adopted site-specific criteria that are consistent with EPA's most recent and scientifically up-to-date acute and chronic aquatic life criteria for metals (except for the chronic criterion for mercury). EPA recommends dissolved aquatic life criteria to set and measure compliance with metal criteria (58 FR 32131). EPA has determined that the dissolved criteria will provide the same level of protection for aquatic life in the water column as the criteria measured as total recoverable because particulate metal is not as biologically available as dissolved metal. Due to the naturally occurring glacial till, the predominate form of metal in upper Cook Inlet is particulate metal and exceedences of total recoverable metals criteria occur.

In the case of mercury, Alaska has adopted an older EPA chronic aquatic life criterion (0.025 ug/l) that is more stringent than the one found in EPA's most recent publication of National Recommended Water Quality Criteria (0.94 ug/l) (April 1999, EPA 822-Z-99-001).

The turbidity in upper Cook Inlet is attributable to suspended solids in rivers that flow

into upper Cook Inlet. The natural levels of turbidity at the site exceed the old Alaska turbidity criterion of 25 NTU. Since aquatic life has adjusted through time to the natural levels of turbidity found at the site, a criterion that does not allow an increase in the natural level of turbidity.

II. Relevant life history of belugas

A. General life history

Beluga whales are cetaceans in the suborder Odontoceti (the toothed whales). These animals share the taxonomic family Monodontidae with narwhals and Irrawaddy dolphins. All Monodontidae species have the rare ability to turn their heads in relation to the body, a trait attributed to the unfused cervical vertebrae in these species (Martin, 1990).

Both the common and scientific names of the beluga indicate its unique white color. Newborn animals have dark gray skin which gradually fades to white during the juvenile years. This stocky species has no dorsal fin and is characterized by a small, rounded head with a bulbous melon that becomes more obvious with age (Martin, 1990). Belugas have unusual control of their facial features with the ability to alter the shape of the melon (possibly to aid in echolocation) and their lips (this may allow the use of suction to forage by drawing invertebrates into the mouth; Martin, 1990; Haley, 1986). Extremely vocal animals, the beluga's frequency and large repertoire of vocalizations has earned it the nickname, "sea canary (Haley, 1986)." In an environment characterized by sea ice, belugas are well-equipped with both a sophisticated echolocation system as well as the ability to dive for as long as 15 minutes and travel as far as 2-3 kilometers per dive (Barnes, 1990).

Beluga whales inhabit arctic and subarctic waters. The total world population consists of 49,000-69,000 animals made up of several populations including the largest population from Alaska and western Canada. Most populations worldwide are in decline, but some are still hunted by Native and/or commercial fisheries (Barnes, 1990). In summer months, belugas follow the receding pack ice into shallow coastal waters, estuaries, and rivers, only to travel off-shore in the winter. Because of their habit to follow the pack ice, belugas are one of the few toothed whales to undertake an annual migration. While essentially marine, these whales can also withstand prolonged periods in fresh or brackish waters (Martin, 1990).

B. Threats

Beluga whales have been hunted by indigenous people in the Arctic for more than a thousand years. While the take resulting from subsistence hunting was likely sustainable, the worldwide commercial hunt that occurred in the 18th and 19th centuries brought high mortalities that the populations could not sustain (Martin, 1990). Commercial and subsistence hunting of belugas still occurs, although at a much reduced level (Dold, 1993). Other disturbances such as commercial fishing gear, shipping, chemical pollution, and oil exploration may also cause problems for this species. In Alaska, oil exploration in coastal waters and hydroelectric plants on rivers have become a concern for calving success (Martin, 1990). Belugas are also known to be susceptible to the toxicity of chemical pollution. The stock most in danger is the Gulf of St. Lawrence, Canada. Deaths and strandings of individuals from this stock have been attributed to

the high levels of toxic chemicals such as PCBs, DDT, and heavy metals in the St. Lawrence River (Smith et al., 1990).

C. Cook Inlet population

Five populations (or stocks) of beluga whales inhabit Alaskan waters. The populations are located in and identified as Bristol Bay, eastern Bering Sea, eastern Chukchi Sea, Beaufort Sea, and Cook Inlet. From geographic observation and genetic analysis, scientists have determined that the Cook Inlet population is the most isolated of the Alaskan belugas (O'Corry-Crowe and Dizon, 1999). After extensive surveys and research, Laidre et al. (1999) have determined that the Gulf of Alaska does not support any other large persistent groups of belugas other than the population in Cook Inlet.

During the summer, large groups (150-200) of beluga inhabit the upper Inlet near the Susitna River Delta and Knik Arm, another group (10-50) occurs between Chickaloon River and Point Possession, and small groups (less than 20) have been observed in lower Cook Inlet (Rugh et al., 1999). The Cook Inlet beluga population gathers in upper Cook Inlet during the summer months and frequently follows the salmon into river mouths during high tide. During the winter months, small groups of beluga are occasionally observed in Cook Inlet, but most individuals are thought to migrate offshore, likely out into the Gulf of Alaska (Hill and DeMaster, 1999).

D. Feeding and feeding grounds

Belugas do not exclusively feed in any one season, however, a greater quantity and quality of food exists in Cook Inlet during the summer months. Most observations of Cook Inlet belugas occur during spring and summer, therefore more detail is available about their summer feeding habits. In April and May, belugas return to upper Cook Inlet following the eulachon (hooligan) runs. Belugas then feed on the salmon runs, chinook and sockeye, with coho salmon in the late summer (B. Mahoney, NMFS, pers. comm., 4 Feb. 2000). While salmon may be the preferred prey, belugas also feed on other schooling fish such as herring, capelin, and smelt, as well as flatfish, cod, sculpins and invertebrates (Lowry, 1994). Using their flexible neck, belugas may forage at or near the bottom in shallow waters where they can produce suction and strong jets of water with their mouths to dislodge prey from the bottom. This species may also hunt in groups for schooling fishes, herding fish into shallow water before attacking (MacDonald, 1993).

E. Reproduction

Belugas mate in late winter or spring, and calve in the warmer, shallower coastal waters, estuaries or rivers in spring or summer. Breeding takes place from February through April with a 14-15 month gestation. Calving generally occurs during May through July (Lowry, 1994). Calves have been observed in Cook Inlet at the mouths of major rivers including the Susitna and Beluga Rivers. The mouths of the rivers may provide a thermal advantage to newborn whales with little fat deposits and incompletely developed thermal regulatory systems (Calkins, 1989).

F. Current population status

The Cook Inlet population has declined in numbers in recent years. In 1994, NMFS estimated population abundance at 653 whales. In 1998, aerial surveys of Cook Inlet resulted in

a population abundance estimate of 347 individuals (Hobbs, et al., 1999). Early population estimates from the 1999 surveys indicate 357 animals (Hunter, 1999).

In response to the decline in the Cook Inlet population, the Alaska Native Marine Mammal Hunter's Committee (ANMMHC) announced a voluntary moratorium on hunting Cook Inlet beluga whales in 1999. To protect the Cook Inlet beluga whales, Senator Ted Stevens (R-AK) introduced legislation to prohibit the hunting of Cook Inlet beluga whales unless such taking occurs pursuant to a cooperative agreement between NMFS and affected Alaska Native organizations. President Clinton signed this bill into law on May 21, 1999 (NMFS, 1999).

G. NMFS designation and critical habitat

NMFS has proposed to designate the Cook Inlet belugas as "depleted" under the Marine Mammal Protection Act (MMPA). Under the MMPA, a depleted designation applies to species or populations that fall below the optimum sustainable population. The MMPA defines optimum sustainable population as "the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element." Once a species or population has been designated as depleted, a conservation plan is developed to guide research and management actions to restore the health of the species. A final rule designating the Cook Inlet beluga whale as depleted under the MMPA is expected in April 2000. NMFS has not yet developed a conservation plan for the Cook Inlet beluga population.

Currently, the Cook Inlet beluga is designated as a candidate species for listing under the Endangered Species Act (ESA). NMFS was petitioned to list the Cook Inlet beluga whale as endangered under the ESA in March 1999. NMFS has not yet responded to the petition, listed the Cook Inlet Beluga population, nor designated critical habitat for this population.

III. Effects of discharge and site specific criteria

A. Action Description

1. Site Specific Criteria

The Municipality of Anchorage has applied for Site-Specific Water Quality Criteria for metals and turbidity the Point Woronzof Area of Cook Inlet.

The criteria changes would include establishing metals criteria based on the dissolved fraction for all metals except mercury. The metals include arsenic, cadmium, chromium (III & VI), copper, lead, nickel, selenium, silver, and zinc. The application also seeks to eliminate the quantitative limit of 25 NTU (nephelometric turbidity units) for turbidity and replace it with a restriction on increases in turbidity greater than 10% over natural conditions.

The site-specific criteria would apply to the area extending from the constriction of Knik Arm at Point Cairn to the northwest and bounded by the shoreline to the mudflats at the entrance to Turnagain Arm and Fire Island on the southwest and west, respectively. (Figure 1-2 from request included)

2. NPDES Discharge

The Asplund Water Pollution Control Facility in the municipality of Anchorage has applied to renew its NPDES permit. The facility discharges chlorinated primary effluent. Technology based limits for this discharge include biological oxygen demand and total suspended solids. Water quality based limits for this discharge include pH, chlorine, and fecal coliform bacteria. However, the effluent from the treatment plant will also contain metals (see Fact Sheet, Table 2).

The zone of initial dilution can be roughly defined as a circle with a radius of 2,130 feet centered 100 feet shoreward of the diffuser (see Fact Sheet, Figure 3). In general, the flushing rate for Knik Arm has been estimated at 30 days or less with greater flushing rates in the spring and summer. Once the water is flushed from Knik Arm, it moves westward out into Upper Cook Inlet.

B. Exposure to contaminants

1. Conventional pollutants

The NPDES discharge permit contains technology-based limits for biochemical oxygen demand and total suspended solids. Biochemical oxygen demand limits provide for sufficient dissolved oxygen in the receiving waters. Beluga whales do not breathe through gills so are not directly affected by the dissolved oxygen of water. Limits on total suspended solids work toward minimizing increases in turbidity. Upper Cook Inlet is naturally a very turbid environment due to the tidal action and high inputs of glacial till. Belugas have sophisticated echolocation abilities that allow them to hunt even in turbid environments.

Water quality based limits are included in the NPDES discharge permit for pH, chlorine, and fecal coliform bacteria. In water, pH reflects the amount of hydrogen ion in the water. For whales, effects of pH tend to occur at very low levels. Highly acidic waters could be caustic to the eyes and mucus membranes of whales. However, the NPDES limits on pH restrict the range to between 6.5-8.5, a more neutral condition. It is unlikely that waters with a maximum acidity of pH 6.5 would cause any irritation to belugas in Cook Inlet because pH 6.5 is very near to neutral. The statewide pH standard for all Alaskan waters is 6.5-8.5 including those waters where the other, more healthy stocks of belugas occur. Given the near neutrality of the pH standard and the uniformity with which it is applied to all waters in Alaska, we have no indication that the pH standard would adversely affect belugas.

As stated before, since belugas are air breathing mammals that lack gills, direct effects of chlorine toxicity in water are unlikely. Chlorine is also not a bioaccumulative chemical that would magnify in the aquatic food chain and affect belugas.

Fecal coliform bacteria are used as an indicator for other micro-organisms (bacteria, viruses, or parasites) in water. A facility like Asplund would typically discharge pathogens from human waste. A few common bacteria found in human sewage may be of concern for beluga whales. These organisms include *Salmonella* species, *Clostridium perfringens*, and *Klebsiella* species. *Salmonella* species may occur in waters when fecal coliform levels are above 200 per

100 mL. *C. perfringens* normally inhabits the human gut and occurs commonly in sewage discharges. This organism can cause septicemic or cutaneous diseases in cetaceans. *Klebsiella* species, also a normal inhabitant of the human gut, may occur frequently in sewage and is associated with pneumonia and septicemia in cetaceans, especially in immunocompromised whales (S. Harris, pers. comm. 8 March 2000).

While the danger from exposure to bacteria from human sewage is possible, it is unlikely that belugas will be exposed to bacteria from the NPDES discharge. As discussed in later sections of this document, the Point Woronzof area is characterized by low species diversity and abundance in the benthos and few resident fish species. Even the resident fish species in the area are capable of and likely to travel great distances to feed. Belugas could be exposed to harmful bacteria from eating fish, benthic invertebrates, and sediment that accumulate the bacteria. The lack of sediment, benthos, and resident fish in the area lead to the conclusion that belugas are unlikely to be adversely affected by the discharge of fecal coliform or other associated micro-organisms associated with human sewage. However, to further define the bacterial discharge from the facility, EPA has included sampling twice per year for *E. coli* in the draft permit.

2. Metals

Marine mammals, such as beluga whales, lack gills and can only be exposed to aquatic toxic contaminants, such as metals, through drinking water, food, bloodstream transfer across the placenta, and mother's milk.

a. Drinking Water

The uptake of metals directly from water is assumed to be negligible. Marine mammals generally obtain water mostly from food. Drinking salt water adds stress to the kidneys in maintaining internal water balance and plasma sodium levels.

b. Food

In order for belugas to be exposed to metals through ingestion of prey, the prey must first accumulate the contaminants in its tissues. Of the metals of concern, only lead, selenium, and mercury are known to biomagnify in aquatic systems. Cadmium, copper, and zinc may bioaccumulate in aquatic species. Mammals have a relatively low absorption rate of cadmium from dietary sources. Metallothionein production can regulate the zinc and copper as essential nutrients. Of those metals that biomagnify (increase in concentration with higher trophic levels), we will focus only on lead and mercury, but not selenium. Selenium has been indicated in toxicological studies of cetaceans as an antagonist for mercury toxicity, but has not been correlated with toxic effects due to selenium exposures alone.

In surveys of the Point Woronzof area where both the NPDES permit and site-specific criteria would apply, the benthic and planktonic communities have low species diversity and abundance. Sampling of the flora and fauna of the Point Woronzof area resulted in few benthic invertebrates and macroalgae. Plankton were limited to diatoms (mostly 1 species) and copepods. The greatest diversity was seen in the nektonic fish. Fish species found in Knik Arm include salmonids, herring, halibut, saffron cod, sculpin, eulachon, and flounder. Sampling in

1989 for demersal fish were unsuccessful, but earlier sampling in 1983 (Dames and Moore, 1983) by beach seine sets caught saffron cod, ringtail snailfish, starry flounder, yellowfin sole, and Pacific staghorn sculpin. Of these, the saffron cod were most abundant.

Due to the nature of many of the species and the habitat in the Point Woronzof area, it is unlikely that biomagnification of contaminants discharged in the action area will occur. Few species or individuals of primary producers or lower trophic level feeders (i.e. plankton, macrofauna, benthic macroinvertebrates) inhabit this area. Fish are likely to feed in other locations due to the lack of food in the Point Woronzof area. Also, many of the fish can travel great distances or feed outside upper Cook Inlet. Herring are likely to travel outside the action area as part of their natural life histories as well as due to the low abundance of plankton in the area. Adult anadromous salmonids feed in oceanic waters, while juveniles are not likely to feed in the action area due to lack of suitable prey. Biomagnification of contaminants absorbed from the water column as dissolved metals will be minimized due to the high concentration of suspended particulates, limiting bioavailability, and short residence times for many of the species.

Biomagnification of contaminants in the food chain may also begin with accumulation in sediment. However, the substrate in the action area contains mostly large rocks and cobble, with little sediment. The fast currents and flushing action in upper Cook Inlet discourages settling of fine sediment, hence the high levels of total suspended solids. The total suspended solids in upper Cook Inlet might serve as a source of contaminants for aquatic species in a manner similar to sediment, except that the suspended solids in Cook Inlet are almost entirely inorganic solids from glacial till that bind tightly to metals.

c. Transfer to young

If metals are highly concentrated in beluga whales and available from the bloodstream, mothers may transfer metals across the placenta to the fetus. Marine mammals possess a unique ability to demethylate methyl-mercury (the most toxic and available form of mercury). Therefore, the form of mercury in marine mammal tissues is most commonly inorganic. Inorganic mercury is not likely to be bioavailable for transplacental transfer to the fetus or for transfer to calves via mother's milk. Lead can be readily transferred across the placenta and through milk discharge. However, it appears that under current conditions in Cook Inlet, belugas do not accumulate high levels of lead when compared to other Alaskan populations. Due to the low possibility of exposure, it appears unlikely that the upper Cook Inlet belugas would accumulate lead from the action area at high enough levels to transfer to their young (Becker, 1999).

C. Indirect biological effects

In evaluating the effects of an action on listed species, we must also evaluate the indirect biological effects of the action such as the effect on prey abundance and quality or potential degradation of habitat.

1. Conventional pollutants

Biochemical oxygen demand limits provide for sufficient dissolved oxygen in the receiving waters. The ambient dissolved oxygen concentrations in Cook Inlet are 8 mg/L. Estimations of the impact of the effluent discharge indicate that the resulting dissolved oxygen immediately following initial dilution would be 7.94 mg/L. This small decrease in dissolved oxygen is unlikely to decrease the abundance or quality of prey species or degrade habitat for belugas or their prey.

Limits on total suspended solids work toward minimizing increases in turbidity. Upper Cook Inlet is naturally a very turbid environment due to the tidal action and high inputs of glacial till. Suspended solids can affect fish by blocking gills or decreasing ability to hunt prey. The effluent discharge will decrease receiving water turbidity and is therefore unlikely to decrease the abundance or quality of prey species or degrade habitat for belugas or their prey.

In water, pH reflects the amount of hydrogen ion in the water. Fish are generally unaffected by neutral pH conditions such as that required by the Alaska water quality standards (EIFAC, 1969; Mount, 1973; Bell, 1971). Effluent discharge must meet the Alaska water quality standards at the point of discharge. The range of pH conditions set forth by the Alaska water quality standards is unlikely to decrease the abundance or quality of prey species or degrade habitat for belugas or their prey.

2. Toxic pollutants

Given the lack of resident prey species within the action area, it is unlikely that the approval of the NPDES discharge permit and the site-specific criteria for metals will decrease the abundance or quality of beluga prey. Likewise, the lack of sediment and the high concentration of suspended solids in the action area indicates that metals from the discharge will not accumulate in the action area and degrade the habitat for belugas.

D. Conclusions

Conventional pollutant discharges allowed by the NPDES permit are not likely to harm beluga whales or their prey. While both the site-specific criteria approval and the NPDES permit renewal will allow metals in the waters of upper Cook Inlet, exposure of beluga whales to harmful levels of these contaminants is expected to be minimal. **Therefore, EPA has determined that renewal of the NPDES permit and approval of the site-specific criteria for upper Cook Inlet are not likely to adversely affect beluga whales.**

IV. Cumulative and indirect effects

EPA is not aware of any projects planned for the action area. However, the city of Anchorage will continue to grow and that growth will result in greater flows at the waste water treatment plant. Projections for growth are included in the assessment of water quality impacts discussed in the fact sheet.

The Asplund facility has applied for a waiver to relieve the requirement for secondary treatment at the waste water plant. Pursuant to Section 301(h)(9) of the Act and 40 C.F.R. 125.60, the applicant must be discharging effluent that has received at least primary or equivalent

treatment by the time the modified permit becomes effective. Primary or equivalent treatment is defined as "...treatment by screening, sedimentation, and skimming adequate to remove 30 percent of the biochemical oxygen demanding material and of the suspended solids in the treatment works influent..."

The existing plant meets the primary or equivalent treatment requirements as required by federal regulations. The applicant presented influent and effluent concentration data for year 1997 in the permit application. The BOD percent removal ranged from 53 - 59%. The TSS removal ranged from 79 - 86%. Secondary treatment includes requirements for 85% removal for both TSS and BOD. The Asplund facility exceeds the removal requirements for primary treatment, but has not met the requirements for secondary treatment. As stated previously, the effects of discharges for BOD and TSS are unlikely to affect belugas or there prey in the action area, therefore, additional requirements to meet secondary treatment criteria would not provide further beneficial effect to beluga whales.

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